

1. A circuit using same components in the ringer- and audio mode of a mobile phone comprising:

- a loudspeaker used in the ringer- and audio mode;
- two identical pulse generators in a mirrored bridge configuration generating pulses for the ringer mode;
- 5 a configuration of switches in a mirrored bridge configuration to activate the circuit either in the ringer or in the audio mode;
- means of setting the volume of the loudspeaker in the ringer-and audio mode; and
- 10 two identical inverting voltage amplifiers in a mirrored bridge configuration to control the audio mode as well as the ringer mode having an input and an output wherein said input is a reference voltage and either input from said pulse generator in the ringer mode or differential input from audio signals in the audio mode and said output is driving the said loudspeaker.

2. A circuit setting the volume of a loudspeaker in the audio mode of a mobile phone via a defined amplitude setting comprising

- a loudspeaker;
- 20 two identical series of switches and correspondent resistors in a mirrored bridge configuration to define the volume of said loudspeaker in the audio mode by amplitude setting wherein one of said switches in each series in the same mirrored position is closed to define the output voltage desired through the chain of resistors between the closed switch and the loudspeaker; and

two identical inverting voltage amplifiers in a mirrored bridge configuration to control the audio mode having an input and an output wherein said input is a reference voltage and differential input from audio signals and said output is driving the said loudspeaker.

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3. The circuit of claim 2 wherein current less high impedance sense paths are used as input to the amplifiers to eliminate the parasitic effects of the resistance of the closed gain switches in the audio mode.

4. A circuit setting the volume of a loudspeaker in the ringer mode of a mobile phone via a defined amplitude setting comprising

a loudspeaker;

two identical pulse generators in a mirrored bride configuration generating pulses for the ringer mode;

two identical series of switches and correspondent resistors in a mirrored bridge configuration to define the volume of said loudspeaker in the ringer mode by amplitude setting wherein one of said switches in each series in the same mirrored position is closed to define the output voltage desired through the chain of resistors between the closed switch and the loudspeaker; and

20 two identical inverting voltage amplifiers in a mirrored bridge configuration to control the ringer mode having an input and an output wherein said input is a reference voltage and signals from the pulse generator and said output is driving the said loudspeaker.

5. The circuit of claim 4 wherein current less high impedance sense paths are used as input to the amplifiers to eliminate the parasitic effects of the resistance of the closed gain switches in the ringer mode.

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6. A circuit using same components in the ringer- and audio mode of a mobile phone wherein the volume adjustment in the audio and ringer mode is provided by a precise amplitude setting via the gain control stages of inverting voltage amplifiers comprising:

- a loudspeaker used in the ringer- and audio mode;
- two identical pulse generators in a mirrored bridge configuration generating pulses for the ringer mode;
- a configuration of switches in a mirrored bridge configuration to activate the circuit either in the ringer or in the audio mode;
- two identical series of switches and correspondent resistors in a mirrored bridge configuration to set the volume of said loudspeaker in the audio mode as well as in the ringer mode by amplitude setting wherein one of said switches in each series in the same mirrored position is closed to define the output voltage desired through the chain of resistors between the closed switch and the loudspeaker; and
- two identical inverting voltage amplifiers in a mirrored bridge configuration to control the audio mode as well as the ringer mode having an input and an output wherein said input is a reference voltage and either input from said pulse

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generator in the ringer mode or differential input from audio signals in the audio mode and said output is driving the said loudspeaker.

5 7. The circuit of claim 6 wherein current less high impedance sense paths for both audio and ringer mode are used as input to the amplifiers to eliminate the parasitic effects of the resistance of the closed gain switches in the audio mode as well as in the ringer mode.